

Amendment under 37 C.F.R. §1.114
Attorney Docket No. 062680
Application No. 10/583,779

REMARKS

Claims 1-6, 8, 10, 11 and 13-26 are pending in the present application. Claims 4, 10 and 15-23 are withdrawn from consideration. Claims 1-3 and 24-26 are herein amended. Claim 9 is cancelled. No new matter has been presented.

Claim Rejections - 35 U.S.C. §§ 102 and 103

Claims 1-3, 5, 6, 8, 11, 13, 14 and 24-26 were rejected under 35 U.S.C. § 102(b) as being anticipated by **Yoshinori** (JP 2002-282703); and claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over **Yoshinori** in view of **Taoda** (US 6,180,548).

Favorable reconsideration is requested.

(1) Applicants respectfully submit that Yoshinori does not teach or suggest:

whereby said coated layer can be peeled from said substrate when a pair of said photocatalyst sheets are mutually thermally welded to form a welded part and when said welded part is peeled off by a peeling test at the rate of 50 mm/min

as recited in claims 1-3 and 24-26.

The Office Action stated that Yoshinori discloses that the sheets may be thermally welded together citing paragraph 22 of Yoshinori. (Office Action, page 5.) The Office Action appears to take the position that the coated layer of the sheets in Yoshinori is capable of being peeled from the substrate when a pair of the sheets are mutually welded when the welded part is peeled off by a peeling test at the rate of 50 mm/min. (Office Action, pages 4-5.) However, there is nothing to suggest that sheets in Yoshinori are capable of being peeled from the substrate under the conditions as recited in the claims.

Paragraph 22 of Yoshinori (see attached verified translation of Yoshinori) states that “In many cases in the textile structure used for above mentioned application, textile structures are sewed with the thermal welding by using such as a high frequency welder and Leister. It is desirable for the supporting layer containing a photocatalyst to be thermoplastic synthetic resin.” There is no description of a peeling test of the photocatalyst sheet or of the photocatalyst sheet having the peeling characteristic under the conditions as recited in the claims.

In Yoshinori, textile structures are described in paragraphs 21, 22 and 31. However, there is no description in Yoshinori about real structures or examples for textile structures. As shown in Examples 1 to 6 of Yoshinori, only film structures, *i.e.*, plastic solid as shown in Fig. 1, is described. Peeling of photocatalyst sheet is not described in Yoshinori.

An important point of the present invention is that the peeling quality is judged as good (O) in the peeling test as shown in Fig. 6 when the photocatalyst layer was completely peeled from substrate such as polyester or glass fiber. (See English Translation PCT application, paragraph [0046].) The speed of 50mm/sec at peeling test is only one of the conditions or parameters of peeling test.

(2) Applicants respectfully submit that Yoshinori does not teach or suggest that “the water contact angle of said photocatalyst sheet surface is 130 degrees or less” as recited in claims 1-3 and 24-26.

In Yoshinori, there is a description about textile structure in paragraph 21 as

The plastic solid according to the present invention may be made by coating onto the textile structure such as woven consisting of polyester or nylon fiber. These plastic solid may be made by coating the plastic sheet covered by resin to at least one side of textile structure or by attaching the plastic sheet formed like a film to at least one side of textile structure. The

textile structure having a sheet shape can be used as a general structural material, especially, for example, the hood of transporter apparatus such as a truck sheet, ... an air dome, a poor cover, etc. can be used widely. Since a surface beautiful state is held over a long period of time, it can be used preferably.

In a claim of Yoshinori it is described that "A textile structure which is provided with the plastic solid according to any one of claims 1 to 13 at least on one side of said textile structure." However, as explained, there is no description in Yoshinori about real structures or examples for textile structure and also Yoshinori does not teach the contact angle of textile structure, and there is no description in Yoshinori about contact angle property of the surface of the photocatalyst containing layer.

(3) Applicants respectfully submit that Yoshinori does not teach or suggest "apatite-coated photocatalyst particles having low water solubility" and that "said apatite is either of apatite hydroxide, apatite carbonate, apatite fluoride, or apatite chloride or a mixture thereof" as recited in amended claims 1-3 and 24-26.

In Yoshinori, describes apatite as a coating material of photocatalyst only at paragraph 21: "The titanium oxide includes the titanium oxide in which surface in part at least with silica, alumina, silica alumina, a zinc oxide, an apatite, PTFE resin, etc." There is no description in Yoshinori about an appetite as recited in the amended claims, *i.e.*, having low water solubility, and that the apatite is either of apatite hydroxide, apatite carbonate, apatite fluoride, or apatite chloride, or a mixture thereof.

(4) Applicants respectfully submit that Yoshinori does not teach or suggest

the coating quantity of said apatite coated on said photocatalyst particles is such that the weight loss ratio of the whole of said photocatalyst sheet is 10% or less when ultraviolet light of intensity of 18 mW/cm² is irradiated

for one hour on the surface of said photocatalyst sheet
as recited in amended claims 1-3 and 24-26.

Yoshinori describes at paragraph 27:

On the surface of the photocatalyst containing layer, the salad oil (made by the Nissin Oil Mills, Ltd.) was coated so that it might become 0.1 mg/cm². It is put into the ultraviolet light illumination apparatus (made by a great Japan plastic company) adjusted so that UV irradiation intensity might become 10 mw/cm².

The minute reductions of the weight of salad oil in every one (1) hour were measured for 5 hours, and the reduction weight of salad oil per hour per 1 cm² were measured. These datum were plotted to pass ... and it is expressed as $\mu\text{g}/\text{cm}^2/\text{hour}$.

From the underlined parts above, it is known that the organic substance means a salad oil and they measure resolution of salad oil coated on the surface of photocatalyst containing layer with the radiation of ultraviolet light. There is no description in Yoshinori about the coating quantity of the apatite as recited in the claims.

(5) Applicants respectfully submit that Yoshinori does not teach or suggest "the particle diameter of said photocatalyst particles is 1 nm to 100 nm" as recited in claims 1-3 and 24-26.

Yoshinori states at paragraph 13:

For example, the photocatalyst covered with porous inorganic substances, such as silica, can be used preferably. As for the hole diameter of the enveloping layer which consists of a porous inorganic substance, the hole diameter of about 5 Angstrom to 1000 Angstrom is desirable, and more preferably, the hole diameter of about 100 Angstrom to 300 Angstrom is desirable.

This description in Yoshinori refers to the hole diameter of the porous inorganic substance which covers the photocatalyst and not the diameter of the phtotocatalyst itself.

(6) Applicants respectfully submit that Yoshinori does not teach or suggest that "the ratio of said apatite-coated photocatalyst particles to said photocatalyst-containing layer is 10-40 weight %" as recited in claims 1-3 and 24-26.

Yoshinori states at paragraph 11:

As for the content of photocatalyst semiconductor particles, it is desirable that it is 5 to 70% of full weight of plastic solid. It is because that coat formation will become difficult if the content of photocatalyst semiconductor particles is too large. It is because that when the content of photocatalyst semiconductor particles is too small the characteristics of photocatalyst are hard to be obtained.

Thus, paragraph 11 of Yoshinori discloses that the content of the photocatalyst semiconductor particles is desirably 5-70 %. This range in Yoshinori overlaps the recited range. However, the recited range is not disclosed in Yoshinori with sufficient specificity for an anticipation rejection. For overlapping ranges, in order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation rejection under the statute." MPEP § 2131.03.

The reasons why the ratio of photocatalyst particles to said photo-catalyst containing layer is to 5-70% in Yoshinori are the following:

(a) in upper limit is coat formation ability; and

(b) in lower limit is ability such as organic substance resolution power.

The ratio of photocatalyst particles above in Yoshinori is derived using titanium oxide particles having a large diameter of 4 micrometer such as disclosed in Example 6 of paragraph 29.

The ratio of photocatalyst particles to said photo-catalyst containing layer of 10-40% in the claims of the present invention is derived by using titanium oxide particles having a diameter of 1 nm to 100 nm, and by using apatite consisting of either of apatite hydroxide, apatite carbonate, apatite fluoride, or apatite chloride, or a mixture thereof, so that the water contact angle is smaller than 130 degrees or less, the coating quantity is as in claim 1 and the peeling characteristics are as in claim 1.

When the photocataysis having large diameter is adopted to textile structure, several problems will occur as follows:

Since photocataysts having large diameter such as 4 micrometer cannot be distributed homogeneously in the dispersion solution of which are consisting of the resin, photocataysts, and solvent to form a photocatayst-containing layer, the surface of the coated photocatayst-containing layer is not smooth. The surface of the coated photocatayst-containing layer will have a concave and convex structure so that the surface of the photocatayst-containing layer will be water repellent. This means that the water contact angle of the surface of the photocatayst-containing layer will be larger than 130 degrees.

For at least the foregoing reasons, claims 1-3, 5, 6, 8, 11, 13, 14 and 24-26 are patentable over the cited references. Accordingly, withdrawal of the rejections of claims 1-3, 5, 6, 8, 11, 13, 14 and 24-26 is hereby solicited.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

Amendment under 37 C.F.R. §1.114
Attorney Docket No. 062680
Application No. 10/583,779

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

/Andrew G. Melick/

Andrew G. Melick
Attorney for Applicants
Registration No. 56,868
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

AGM/adp

Attachment: Partial English Translation of JP 2002-282703 with Declaration